represented as a single pixel in the optimization mode is instead represented as multiple pixels in the super-sampling mode. In other words, the image defined by the super-sampled data is blown up or magnified as compared to the image defined by the data prior to super-sampling. The graphical data super-sampled by pipelines 56-59 is rendered to frame buffers 66-69, respectively.

The graphical data stored in frame buffers 65-69 is then transmitted to compositor 76, which then combines or composites the graphical data into a single data stream for display device 83. Before compositing or combining the graphical data, the compositor 76 first processes the super-sampled data received from frame buffers 66-69. More specifically, the compositor 76 reduces the size of the image defined by the super-sampled data back to the size of the image prior to the super-sampling performed by pipelines 56-59. In reducing the size of the image defined by the super-sampled data, the compositor 76 averages or blends the color values of each set of super-sampled pixels that is reduced to a single pixel such that the resulting image defined by the processed data is anti-aliased.

As an example, assume that a portion of the graphical data originally defining a single pixel is super-sampled by one of the pipelines 56-59 into four pixels. When the foregoing portion of the graphical data is processed by compositor 76, the four pixels are reduced to a single pixel having a color value that is an average or a blend of the color values of the four pixels. By performing the super-sampling and blending for each pixel defined by the graphical data transmitted to pipelines 56-59, the entire image defined by this data is anti-aliased. Note that super-sampling of the single pixel into four pixels as described above is exemplary, and the single pixel may be super-sampled into numbers of pixels other than four in other examples. Further, any conventional technique and/or algorithm for blending pixels to form a jitter enhanced image may be employed by the

compositor 76 to improve the quality of the image defined by the graphical data stored within frame buffers 66-69.

To better illustrate the operation of the system 50 in the super-sampling mode, assume that the application 17 issues a command to display the 3D object 284 depicted in FIG. 10. In the this example, graphical data defining the object 284 is transmitted from client 52 to master pipeline 55. The master pipeline 55 transmits this graphical data to each of the slave pipelines 56-59. Since the object 284 is not to be displayed within portions 267 and 269, the screen coordinates of the object 284 should be outside of the ranges rendered by pipelines 57 and 59. Thus, slave pipelines 57 and 59 should discard the graphical data without rendering it to frame buffers 67 and 69. Preferably, bounding box techniques and/or other data optimization techniques are employed to discard the graphical data defining the object 284 before the coordinates of this graphical data are translated to screen relative by pipelines 57 and 59 and/or before other significant processing is performed on this data by pipelines 57 and 59.

Since the top half of the object 284 is to be displayed within portion 266, the screen coordinates of the object should be within the range rendered by pipeline 56 (*i.e.*, from screen coordinates (700, 1000) to (1000, 1300)). Thus, slave pipeline 56 should render the graphical data defining the top half of the object 284 to frame buffer 66. However, since the bottom half of the object 284 is not to be displayed within portion 266, the screen coordinates of the bottom half of the object 284 should be outside of the range rendered by the pipeline 56. Thus, the slave pipeline 56 should discard the graphical data defining the bottom half of the object 284 without rendering this data to frame buffer 66. Preferably, bounding box techniques and/or other data optimization techniques are employed to discard the graphical data defining the bottom half of the object 284 before the coordinates of this

graphical data are translated to screen relative by pipeline 56 and/or before other significant processing is performed on this data by pipeline 56.

In rendering the top half of the object 284, the pipeline 56 super-samples the data defining the top half of object 284 before storing this data in frame buffer 66. For illustrative purposes, assume that each pixel defining the top half of object 284 is super-sampled by pipeline 56 into four pixels. Thus, if the super-sampled data stored in frame buffer 66 were somehow directly rendered in region 249 without the processing performed by compositor 76, the image displayed by display device 83 should appear to be magnified as shown in FIG. 11.

Since the bottom half of the object 284 is to be displayed within portion 268, the screen coordinates of the object should be within the range rendered by pipeline 58 (*i.e.*, from screen coordinates (700, 700) to (1000, 1000)). Thus, slave pipeline 58 should render the graphical data defining the bottom half of the object 284 to frame buffer 68. However, since the top half of the object 284 is not to be displayed within portion 268, the screen coordinates of the top half of the object 284 should be outside of the range rendered by the pipeline 58. Thus, the slave pipeline 58 should discard the graphical data defining the top half of the object 284 without rendering this data to frame buffer 68. Preferably, bounding box techniques and/or other data optimization techniques are employed to discard the graphical data defining the top half of the object 284 before the coordinates of this graphical data are translated to screen relative by pipeline 58 and/or before other significant processing is performed on this data by pipeline 58.

In rendering the bottom half of the object 284, the pipeline 58 super-samples the data defining the bottom half of object 284 before storing this data in frame buffer 68. For illustrative purposes, assume that each pixel defining the bottom half of object 284 is super-sampled by pipeline 58 into four pixels. Thus, if the super-sampled data stored in frame